CLAIMS

1. A gas refining system wherein sulfur compounds contained in a high-temperature and high-pressure reducing gas obtained by a pressure gasification of an ingredient such as coal or heavy oil are adsorbed and removed by an adsorbent in a form of a sulfide; the adsorbent having the sulfide formed thereon is regenerated by roasting it with an oxygen-containing gas, and a regeneration gas containing sulfur dioxide formed by a roasting reaction is introduced into a reactor where the regeneration gas and an oxygen-containing gas are blown into a calcium compound-containing slurry fed to said reactor and brought into gas-liquid contact with the slurry to effect the absorption of sulfur dioxide and a precipitation of gypsum within said reactor; and temperature control means is provided for selectively controlling a temperature of the slurry within said reactor so as to fall within at least a first temperature range which causes α-gypsum hemihydrate to precipitate or a second temperature range which causes gypsum dihydrate to precipitate.

2. A gas refining system as claimed in claim 1 wherein said temperature control means comprises a temperature sensor for detecting the temperature of the slurry within said reactor, a coolant passage formed around said reactor, a flow control valve for controlling a flow rate of the coolant

passed through said coolant passage, and a temperature controller for controlling an opening of said flow control valve according to the deviation of an output value of said temperature sensor from a target value in such a direction as to cause the output value of said temperature sensor to agree with the target value, and wherein the target value of said temperature controller can be selectively preset so as to fall within at least said first temperature range or said second temperature range.

3. A gas refining system as claimed in claim 1 or 2 wherein a gas produced over a surface of the slurry within said reactor is discharged from said reactor as regeneration recycle gas and recycled for use as the oxygen-containing gas in the roasting reaction of the adsorbent, and which comprises oxygen feed rate control means for continuously adjusting the flow rate of the oxygen-containing gas blown into the slurry within said reactor to a value corresponding to a sum of an amount of oxygen required to completely oxidize a sulfurous acid absorbed into the slurry and an amount of oxygen required for the roasting reaction of the adsorbent.

4. A gas refining system wherein sulfur compounds contained in a high-temperature and high-pressure reducing gas obtained by a pressure gasification of an ingredient such as coal or heavy oil are adsorbed and removed by an adsorbent

in a form of a sulfide, the adsorbent having a sulfide formed thereon is regenerated by roasting it with an oxygen-containing gas, and a regeneration gas containing sulfur dioxide formed by a roasting reaction is introduced into a reactor where, by use of gas blowing means, the regeneration gas and an oxygen-containing gas are blown into a calcium compound-containing slurry fed to said reactor and brought into gas-liquid contact with the slurry to effect the absorption of sulfur dioxide and a precipitation of gypsum within said reactor; a pressure vessel is provided into which the regeneration gas can be blown under at least a pressure higher than atmospheric pressure; and said gas blowing means comprises a stirring rod disposed in a lower part of said reactor so as to be horizontally rotatable, and at least a gas supply pipe disposed integrally with said stirring rod for injecting the regeneration gas and the oxygen-containing gas in a vicinity of said stirring rod.

5. A gas refining system as claimed in claim 4 wherein said reactor comprises a rotary joint for connecting a fixed pipe for supplying the regeneration gas and the oxygen-containing gas with said gas supply pipe rotating together with said stirring rod, and a motor for driving said stirring rod and said gas supply pipe into rotation, said rotary joint and said motor being disposed within said reactor.